
Engineering guidelines

Meridian 1 supports a maximum of 16 MSDL cards regardless of system size. Systems that lack available network card slots may not be physically able to accommodate 16 MSDL cards.

Available network card slots

The number of available network slots in Meridian 1 depends on the system option, the system size, and the number of available network slots in each module for the selected system option.

[Table 1](#) lists Meridian 1 system options, their corresponding network module types, and the network card slot numbers for the type of module used in the system.

Some of these network card slots are normally occupied by Network Cards, Superloop Network Cards, Conference/TDS, and others, leaving a limited number of unused slots for MSDL and other cards.

Meridian 1 card mix

A Meridian 1 that exclusively uses MSDL cards can support up to 16 such cards, providing 64 ports. These ports can be used to run various synchronous and asynchronous operations simultaneously.

The Meridian 1 system will also support a mix of interface cards (MSDL, DCHI, and ESDI for example). However, using multiple card types will reduce the number of cards and ports available.

Refer to *Meridian 1 serial data interface cards description* (553-3001-107) for complete discussions of the specific card types.

Table 1
MSDL card location

Meridian 1	Module	Card slots
21E	NT8D11 CE/PE	Network slots 4–9
51	NT6D39 CPU/Network	Network slots 1–8
61	NT6D39 CPU/Network	Network slots 1–8
71	NT8D35 Network	Network slots 5–13
81	NT8D35 Network	Network slots 5–13
STE	QCA136 CE	Network slots 5–13
RT	QCA147 Network	Network slots 2–10, 12
NT	QSD39 Network (LH) QSD40 Network (RH)	Network slots 2–10, 12, 13 Network slots 5–13, 3
XT	QSD39 Network (LH) QSD40 Network (RH)	Network slots 2–10 Network slots 5–13

Address decoding

The MSDL card decodes the full-length address information received from the Meridian 1. This provides 128 unique addresses. Since MSDL ports communicate with the CPU using a single card address, the Meridian 1 can support 16 MSDL cards providing 64 ports.

The MSDL card addresses are set using decimal switches located on the card. These switches can select 100 unique card addresses from 0 to 99.

An address conflict may occur between the MSDL and other cards because of truncated address decoding by the other cards. For example, if a DCHI port is set to address 5, its companion port will be set to address 4, which means that none of the MSDL cards can have hexadecimal address numbers 05H, 15H, ...75H, nor addresses 04H, 14H, ...74H. To avoid this conflict, X11 release 19 limits the MSDL card addresses from 0 to 15.

Port specifications

The MSDL card provides four programmable serial ports configured with software as well as with switches for the following modes of operation:

- synchronous ports 0–3
- asynchronous port 0 (beginning with X11 release 19)
- DCE or DTE equipment emulation mode
- RS-232 or RS-422 interface

Transmission mode Configure an MSDL port for synchronous or asynchronous data transmission using LD 17.

Synchronous transmission uses an external clock signal fed into the MSDL.

[Table 2](#) lists the synchronous interface specifications and the means of configuring the interface parameters.

Table 2
Synchronous interface specifications

Parameter	Specification	Configured
Data bits	In packets-Transparent	N/A
Data rate	1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 48, 56, and 64 kbps	Software
Transmission	Full Duplex	N/A
Clock	Internal/External	Software
Interface	RS-232	Software
	RS-422	Switches
Mode	DTE or DCE	Switches

Asynchronous transmission uses an internal clock to generate the appropriate baud rate for serial controllers.

[Table 3](#) lists asynchronous interface specifications and the means of configuring interface parameters.

Table 3
Asynchronous interface specifications

Parameter	Specification	Configured
Data bit, parity	7 bits even, odd or no parity, or 8 bits no parity	Software
Data rate	0.3, 0.6, (1.2), 2.4, 4.8, 9.6, 19.2, and 38.4 kbps	Software
Stop bits	1 (default), 1.5, 2	Software
Transmission	Full Duplex	N/A
Interface	RS-232	Software
	RS-422	Switches
Mode	DTE or DCE	Switches

Emulation mode Each port can be configured to emulate a DCE port or a DTE port by setting the appropriate switches on the MSDL. For details on how to set the switches, refer to “Installation” on page 19 of this document.

DCE is a master or controlling device that is usually the source of information to the DTE and may provide the clock in a synchronous transmission linking a DCE to a DTE.

DTE is a peripheral or terminal device that can transmit and receive information to and from a DCE and normally provides a user interface to the system or to a DCE device.

Interface Each MSDL port can be configured as an RS-232 or an RS-422 interface by setting the appropriate switches on the card.

[Table 4](#) lists the RS-232 interface specifications for EIA and CCITT standard circuits. It shows the connector pin number, the associated signal name, and the supported circuit type. It also indicates whether the signal originates at the DTE or the DCE device.

This interface uses a 26-pin (SCSI II) female connector for both RS-232 and RS-422 circuits.

Table 4
RS-232 interface pin assignments

Pi n	Signal name	EIA circuit	CCITT circuit	DTE	DCE
1	Frame Ground (FG)	AA	102	—	—
2	Transmit Data (TX)	BA	103	X	
3	Receive Data (RX)	BB	104		X
4	Request to Send (RTS)	CA	105	X	
5	Clear to Send (CTS)	CB	106		X
6	Data Set Ready (DSR)	CC	107		X
7	Signal Ground (SG)	AB	102	—	—
8	Carrier Detect (CD)	CF	109		X
15	Serial Clock Transmit (SCT)	DB	114		X
17	Serial Clock Receive (SCR)	DD	115		X
18	Local Loopback (LL)	LL	141	X	
20	Data Terminal Ready (DTR)	CD	108.2	X	
21	Remote Loopback (RL)	RL	140	X	
23	Data Rate Selector (DRS)	CH/CI	111/112	X	
24	External Transmit Clock (ETC)	DA	113	X	
25	Test Mode (TM)	TM	142		X

Table 5 lists RS-422 interface specifications for EIA circuits. It shows the connector pin number, the associated signal name, and the supported circuit type. It also indicates whether the signal originates at the DTE or the DCE device.

Table 5
RS-422 interface pin assignments

Pin	Signal Name	EIA Circuit	DTE	DCE
1	Frame Ground (FG)	AA	—	—
2	Transmit Data (TXa)	BAa	X	
3	Receive Data (RXa)	BBa		X
4	Request to Send (RTS)	CA	X	
5	Clear to Send (CTS)	CB		X
7	Signal Ground (SG)	AB	—	—
8	Receive Ready (RR)	CF		X
12	Receive Signal Timing (RST)	DDb		X
13	Transmit Data (TXb)	BAb		X
14	Transmit Signal Timing (TSTb)	DBb		X
15	Transmit Signal Timing (TSTa)	DBa		X
16	Receive Data (RXb)	BBb		X
17	Receive Signal Timing (RSTa)	DDa		X
20	Data Terminal Ready (DTR)	CD	X	
23	Terminal Timing (TTa)	DAb	X	
24	Terminal Timing (TTb)	DAa	X	

Implementation guidelines

The following are guidelines for engineering and managing MSDL cards:

- An MSDL can be installed in any empty network card slot.
- A maximum of eight MSDL cards can be installed in a fully occupied module because of the module's power supply limitations.
- The Clock Controller Card should not be installed in a module if more than 10 MSDL ports are configured as active RS-232 (rather than RS-422) ports in that module because of the module's power supply limitations.
- The MSDL address must not overlap other card addresses.
- Before downloading a peripheral software module for an MSDL, disable all MSDL ports on cards running the same type of operation.

Environmental and power requirements

The MSDL card conforms to the same requirements as other interface cards. The temperature, humidity, and altitude for Meridian 1 equipment, including the MSDL, should not exceed the specifications shown in [Table 6](#).

Table 6
Environmental requirements

Condition	Environmental specifications
Operating	
Temperature	0° to 50° C (32° to 122° F)
Relative Humidity	5% to 95% noncondensing
Altitude	3,048 meters (10,000 feet) maximum
Storage	
Temperature	–50° to 70° C (–58° to 158° F)
Relative Humidity	5% to 95% noncondensing

A stable ambient operating temperature of approximately 22°C (72°F) is recommended. The temperature differential in the room should not exceed $\pm 3^{\circ}\text{C}$ ($\pm 5^{\circ}\text{F}$).

The internal power supply in each module provides DC power for the MSDL and other cards. Power consumption and heat dissipation for the MSDL is listed in [Table 7](#).

Table 7
MSDL power consumption

Voltage (VAC)	Current (Amps)	Power (Watts)	Heat (BTUs)
+5	3.20	16.00	55.36
+12	0.10	1.20	4.15
-12	0.10	1.20	4.15